



Winnicentrics

The Journal of the Winnipeg Centre of the Royal Astronomical Society of Canada



Spruce Woods, the Happy Surprise

by *Lindsay Price*

The weekend was better than most of us suspected. Five members from Winnipeg (Tim, Joe, Ken, gAIL, Mark and his wife Verle-Ann) and three from Brandon (Carey, Jeff and Trevor) showed up with tents, trailers and telescopes on Friday. The rain stopped and they were rewarded with about an hour of clear skies. I showed up on Saturday, primarily because we had told the public we would be there, and if it was lousy weather, someone has to be on hand if only to tell people that we cancelled the stars for the night. Anyway, Saturday was gorgeous! Clear, with dark skies to compare with any that I have seen, even at Cypress Hills. There were many more visitors than I expected to be in a park in September with poor weather expectations, and the numbers were augmented with a Girl Guide unit camping nearby. Lots of questions and interest, especially when we told people about the SMART-1 launch to the moon that very day. All the people disappeared by 22:00 hrs as scheduled and we had some great observing. President gAIL moved from 'scope to 'scope giving help to find objects, and encouraging us to keep looking for new entries for our lists. (It worked, I got two more for my Explore the Universe tally.)

Around midnight, dew had covered about everything made of glass and metal, so we sat down by the campfire, hot chocolate and cigars were passed around and life doesn't get any better than that! Two of the guys cheated; when we had to stop, they put their gear into one of the heated campers, and when the rest of us turned in at about 01:00 they got another hour of observing with their nice dry telescopes.

On Saturday, it took all my self-discipline to make myself go, and as so often happens, it turned out to be wonderful! Can hardly wait for next year.

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Deadline for the next issue is
 December 21, 2003

MEETINGS

Room 118, St. John's College

November 14 Friday

Beginners Session 7:00

Regular Meeting 7:30

Main Speaker: Jennifer West

Our own Milky Way Galaxy provides a unique opportunity to study galactic structure in much more detail than is offered by distant galaxies. New radio observations of the Milky Way Galaxy are revealing a stunning amount of detail never before observed. Of particular interest, are interactions between the disk (the plane of the Galaxy) and the halo (the region away from the plane). Supernovae events and active star-forming regions, confined to the disk, are thought to be the sources of energetic particles observed in the Galactic halo. Theory suggests that the energy from these regions produce bubbles in the interstellar medium. These bubbles expand and burst out of the Galactic disk producing outflows to the Galactic halo that have been termed "chimneys". In 1996, the star-forming region known as W4 was presented as one of the first observational chimney candidates. In my research, I have found evidence that this region is in an evolutionary stage between a bubble and a chimney.

Plus the regular features: "What's New" in the Sky, "Spacecraft Update" by Jay Anderson, "Explore the Universe" Observing Certificate by Lindsay Price, "How to Use Registac" by Gord Tulloch and Gail's "Constellation of the Month" looks at Aries the Ram.

December 12 Friday

Beginners Session 7:00

Regular Meeting 7:30

Gord Tulloch will once again be joining us to present an introduction to Amateur Telescope Making (ATM), including a plethora of subjects such as grinding your own mirror, creating an optical tube assembly, constructing a mount, and adding computer controlled tracking and GOTO to an existing or newly built telescope. He'll have lots of pictures and examples from his recently completed 8" f/10 planet killer telescope housed in the Rainbow Cove Astronomical Observatory in his back yard as well as his current 9" and 16" projects.

Plus the regular features: "What's New" in the sky, "Spacecraft Update" by Jay Anderson, "Explore the Universe" Observing Certificate by Lindsay Price and Gail's "Constellation of the Month" looks at Puppis.

OBSERVING

November 15 Saturday
Glenlea Observatory
8:00 p.m. to ???

The nights are getting dark earlier now so this is a great time to work on your certificates before the really cold weather comes! These observing nights are always lots of fun, whether you're a beginner or someone who has been enjoying this hobby for years.

December 13 Saturday
Glenlea Observatory
8:00 p.m. to ???

We can see the winter constellations now. This is a great opportunity to come out and learn from the more seasoned observers. Coffee, tea and hot chocolate are available when it gets too cold to stay out very long.

As it's getting dark earlier and the mosquitoes are gone members will be more interested in going out to Glenlea. If you are interested in using the Warm Room please contact Robin Woods for a key (\$10.00 deposit required). If you would like training on the LX200 Robin will be running training sessions, but not on Members Observing Nights. You can contact him at 586-4173 or robin.woods@uwinnipeg.ca or talk to Robin at a meeting.



Move Over, Mars!

by Gabi Durocher

“Could you show us the Hercules Great Cluster, please? We’ve seen Mars already!” The voice sounded young and came from not too high above the ground in the dark. “Sure!” It was an impressive request coming from a boy perhaps 8 or 9. He was determined. So when his turn came at our scope station, one of thirty or so at the Birds Hill Mars Mania event, Dianne and I swung the front of a 6-inch Dobsonian to face Hercules and... the Parking Lot.

With blinding headlights from more than a thousand cars coming, going and idling for Mars, plus a de-collimated finder on our scope (oops), the requested Messier-13 cluster was easier to promise than honour. Dianne jumped in to help with a little diversion. “Do you know you can see a whole galaxy out there with your very own naked eyes?” Dianne was pointing to Andromeda. “Cool,” came the response. So far so good, but how would she lead young and sharp eyes to what is nevertheless a faint fuzzy in the night sky.

You can try leading them to Mirach, then up to fainter Mu Andromedae and up one more to even fainter Nu. You may now have a child fluent in ancient Greek, Latin and Arabic, but no closer to his first glimpse of the magnificent galaxy! And you promise yourself to find out if the RASC might have a green laser pointer for such occasions.

But the boy’s older sister came to the rescue with a clever idea. She stood with

an arm fully raised. Dianne then instructed her, “move a little more to the left... and now a little further away... Right on!”

“Cool, I can see it,” said the boy as he was sighting the Andromeda Galaxy perfectly lined up beyond the tip of his sister’s raised arm and fingers, a human Telrad.

By then our scope was ready to show off M-13, the finest globular cluster in the Northern Hemisphere. It’s likened to a pinch of sugar on a black velvet backdrop by Astronomy writer Philip Harrington. “Cool!” was the encouraging response. The Great Hercules cluster is a bevy of 300,000 to 1 million stars, depending on whom you ask. It’s lying in the halo of our galaxy, outside the galactic disk. It’s a geriatric ward of stars going back perhaps 10 billion years.

We urged the boy’s whole family to take a second look now, because if you wait a few million years you may not see them shine again! These stars are so old, they go back almost to the Big Bang.

Later that night we had a poignant encounter. We were able to show Mars to a young father whom, we guessed, was in a personal drama with fading vision. He found it difficult to use the telescope and was soon discouraged. His wife asked if we would let him try again. She guided him gently several times until he succeeded. It seemed to her of great significance that he see Mars. We wondered if this would be his last chance to sight the red planet.

At another moment a mother with babe in arms was grateful to use our lawn chair to

nurse her newborn. Later, standing, she was keen to see the summer triangle. Following our instructions she was tracing an imaginary line from the left side of the bowl in the Big Dipper, all the way and bending back “further back... to Vega behind you.” She showed such zeal while being top heavy with infant that Dianne moved in to support her back, fearing a sudden toppling. It got us wondering how good our insurance coverage is!

We overheard a group of francophones at a nearby scope station. A woman in the group loudly expressed her frustration and disappointment at the sight of Mars. “C’est vraiment rien!” Yet she must have had a pretty good view of Mars from none other than the presidential telescope, Gail Wise’s 8-inch pink Dobsonian. We had been at the same eyepiece just minutes earlier to enjoy a delicate but sharp image of the planet with the southern polar cap clearly showing. There was also a hint of Aurorae Sinus and Meridiani Terra, darkish areas believed to be the product of dust and wind erosion exposing darker volcanic rock.

I approached the francophones and offered to organize an all-French viewing session for them another night. I scribbled my phone number for the woman who had initially complained to her friends. I felt a bit embarrassed, wondering if astronomers are known for inviting young women to see their private collections of globular clusters!

I told them about Mount Olympus on Mars, the largest shield volcano in the solar system with a summit height of about 24 kilometres. On earth our tallest volcano is Mauna Loa in Hawaii which stands 9 Kms tall. I also mentioned Mars’ Mariner Valleys, a network of canyons so big it could cover a good chunk of Southern Canada if it was on earth. On such a night it is perhaps our minds’ eye that is the best telescope of all.

As the Mars Mania event was winding down one of the most active volunteers, Stan Runge, was looking cold as he was still manning the RASC’s giant 14 inch Dobsonian. We offered him some tea. He accepted this humble gift with appreciation and obvious pleasure just holding the warm cup. The white china was shining a little in the chilly night. He looked like a man enjoying the whole universe in that cup of tea. A fitting end to an unusual star party attended by a crowd estimated at more than four thousand people on that beautiful Sunday night of August 31, 2003.



ATM Journal 6: Polishing Your Mirror

By Gordon Tulloch, RASC Winnipeg

Before we discuss next steps in getting your mirror completed, I realize last article I was remiss in discussing an important concept in making sure your pitch lap is effective when you resume polishing after a break of any significant length: cold pressing the lap.

Recalling that pitch is essentially a very viscous fluid at room temperature, one should remember that the actual shape of the lap changes fairly rapidly as it cools and sits drying on the bench. When we resume polishing it's likely that the lap is not a different shape than the surface of the mirror, and must be brought back into perfect synchronization to be most effective in polishing your mirror.

The solution is doing a cold press, which is similar to the warm press you did when first creating the lap but without heating the lap. A cold press should be done immediately before resuming polishing your mirror, and consists of simply placing your lap on the mirror (or vice versa depending on how you prefer to polish) and applying some weight. I normally just cover the mirror and tool with plastic (to ensure that no dirt or stray grit get near the surfaces) and put a bucket of water on top. 10 or 15 minutes later your lap should be ready to go. Some people espouse warming the lap (for example with a light bulb or heat lamp) and doing a warm press but this can be iffy – too much heat and you'll end up closing the channels in your lap. Since you must have channels in the lap you must then either laboriously reopen the channels or remake the lap. Cold pressing works fine.

As mentioned last time, to go to the next step in completing your mirror, you must go about building or otherwise obtaining a Foucault Tester for testing your mirror. Your homework last time was to check out the following website:

http://www.stellafane.com/atm/atm_foucault_tester/atm_tester_main.htm

This site describes the construction of a Foucault (and Ronchi) Tester and a mirror stand in detail. My own tester was built in an evening based on these plans at very low cost – see the picture below to see how my setup looks (note the mirror on the stand in the background upper right).



Without a doubt the process of parabolizing and “figuring” a mirror for use in an astronomical telescope is the most challenging part of grinding your own mirror – many people give up at this point and shelve their mirrors, or send them off to a professional optical company to complete the job. However, with perseverance and help from experienced ATMs locally as well as on the Internet, it's possible to figure your mirror to a higher level of quality than is possible in any but the most meticulous optical houses. Before we describe how to go about it, let's take a step back and understand what we're trying to achieve.

So far, our objective has been to produce a completely spherical surface. In other words, our mirror surface conforms to the theoretical surface of a sphere with a radius equal to the **Radius of Curvature (ROC)** or twice the focal length of our mirror. Unfortunately, a purely spherical surface does not suffice for most telescopes because unless the mirror is relatively small (6" or under) and has a relatively long focal length ($f/8$ or better) a spherical mirror does not focus all of the light that strikes the mirror to a single point (as shown in figure 1 – note that the curve is very exaggerated)

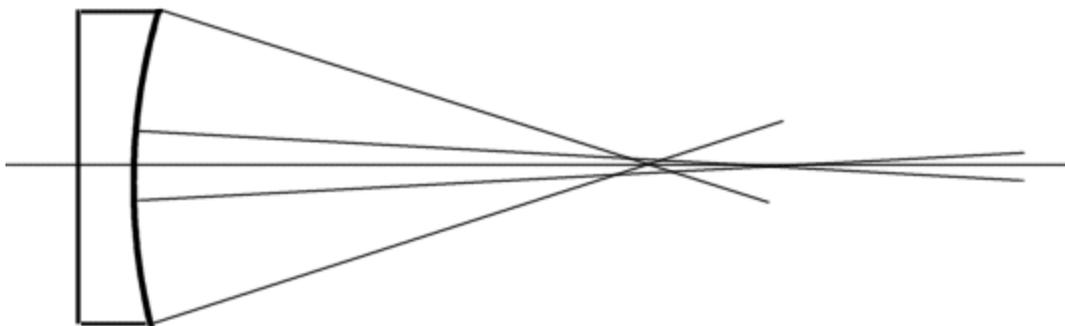


Figure 1 – A Spherical Mirror

Assuming an infinitely distant source and small mirrors with long focal lengths, the difference between where light reflecting off the edge of the mirror and the center is so minimal due to the long light path, a spherical mirror will perform within acceptable limits. For larger or shorter focus mirrors, we must have some way to have all points on the mirror focus correctly – it turns out that a figure of revolution conforming to a Paraboloid will achieve exactly that.

Paraboloids differ from spheres in that the center has a steeper curvature, focusing the light hitting the centre of the mirror closer in than a sphere, matching the light from the outer sections.

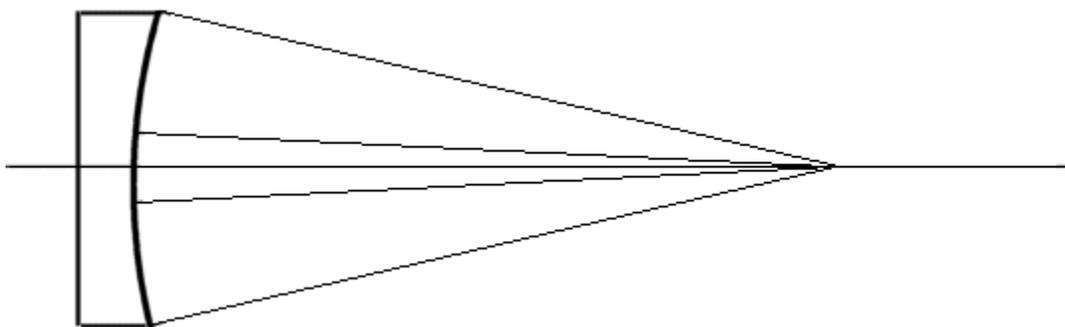


Figure 2 – A Paraboloidal Mirror

So, we learn we must somehow “figure” our mirror to produce a paraboloidal shape and somehow determine if that shape is the one that will properly focus light to our eye. The former means we must adapt our polishing stroke to work more rapidly on the middle of the mirror than the edges. The latter requires that we learn how to measure the exact shape of our mirror to a accuracy of millionths of an inch. Fortunately, simple tests exist to do just that.

In the mid-19th century, Leon Foucault (already famous for his 1851 experiment in the Panthéon in Paris where he used a pendulum to demonstrate the rotation of the Earth, his invention of the gyroscope, and his measurement of the speed of light in air and water – this was one smart fellow!) essentially created the modern metalized mirror telescope and a “knife edge test” to accurately figure these mirrors to sub-wavelength surface accuracy.

The knife edge test takes advantage of the fact that while a light source at infinity will focus at different points for a spherical mirror, a light source located at the center *of the ROC* will have light reflected back to a focus by the mirror. So, by introducing a knife edge into the reflected light from the mirror and seeing where the shadow of the knife edge actually cuts off (nulls) reflected light from the mirror, we can actually determine where the light comes to a focus. More interestingly for non-spherical mirrors, we can determine where different parts of the mirror come to focus so we can measure where the edges, middle, and center zones of the mirror come to focus and qualitatively determine what the shape of our mirror is and how it complies to a perfect paraboloid. Fittingly, this test is called the **Foucault Test**.

Next time, we'll look at how you can measure the surface of your mirror and see what shape it is. In subsequent articles we'll look at how to change the shape of your mirror into a paraboloid, and some ways to fix problems that might occur during the process. Finally, we'll look at some other tests that can be helpful during figuring, including the Ronchi test, and star testing. As always, questions or comments are welcome at gtulloch@shaw.ca

NOTE: The space we have in our newsletter does not permit a full and detailed discussion on these principles – however, the reader is invited to surf to the following web site:

<http://www.atmsite.org/contrib/Harbour/Foucault.html>

David Harbour has written a most excellent and accessible introduction to the subject. For those who do not have access to the Internet, please let me know and I'll make copies of this publication available to you.



The following members are working toward their:

Messier Certificates:

Eugene d'Auteuil	41
Robin Woods	87
Lindsay Price	21
Kilmeny Jones	12
Carey Deschamps	64

Explore the Universe:

Terra Jentsch	9
Stan Runge	6
Lindsay Price	71
Timothy Kennedy	8
Kilmeny Jones	40
Don Radford	39
Sandy Shewchuk	14

Herschel 400's

Stan Runge	93
Sean Ceaser	133
Gail Wise	264

Finest NGC's:

Sean Ceaser	67
Robin Woods	7

Congratulations to **Janice Low** on receiving her Explore the Universe Certificate!

Congratulations to **Sean Ceaser** on receiving his Messier Certificate!

Congratulations to **Mike Stephens** on completing his Explore the Universe List!

From Janice Low:

This is a note of appreciation to the Winnipeg Centre of the RASC for the club support with my astronomy interest. I am delighted to have the "Explore the Universe Certificate". It has been an informative way to learn how and what to observe. I look forward to continuing with the club and pursuit of astronomy knowledge. With appreciation, Janice

Winnicentrics is published six times each year by the Winnipeg Centre, RASC. *Winnicentrics* is produced by and for the members of the Winnipeg Centre, and any opinions expressed are those of the author. If you have comments, questions or concerns about *Winnicentrics*, you can contact any of the councilors or write to RASC, Winnipeg Centre, Box 2694 Winnipeg MB R3C 4B3

Our club is really growing! We have the following new members

Ralph Croning, Winnipeg
David Findlay, Winnipeg
Doug Good, Winnipeg
Jon Gudmundson, Winnipeg
Alex Mills, Winnipeg
Bhagwan Thadani, Winnipeg
Ian Timshel, Roseau River
Phyllis Toews, Winnipeg
Alea Unrau, Winnipeg
Judge Wood, Lac du Bonnet
Ron Zagrodnik, East St Paul
Steve Lamotte, East St Paul
Larry Rehaulk, Winnipeg
Gerry Smerchanski, Teulon

Welcome to our club!

**The Winnipeg Centre
Executive Council**

President

Gail Wise 253-8297
wgail@mts.net

Past-President

Scott Young
sdyoung@mb.sympatico.ca
1st Vice-President

Robin Woods 586-4173
robin.woods@uwinnipeg.ca
2nd Vice-President

Lindsay Price 831-0150
flprice@mts.net

Secretary

Jay Anderson 474-1485
jander@cc.umanitoba.ca

Treasurer

Stan Runge 261-9984
stanrunge@hotmail.com

Councilors

Jennifer West 284-6548
westjl@cc.umanitoba

Lloyel Hull 256-6510
lloyelhull@shaw.ca

Ron Berard 668-6551
rberard@mts.net

Sean Ceaser 797-4509
drceaser@netscape.net

Kevin Black 224-0182
cblack@shaw.ca

Appointed Positions

Librarian

Fred Wood 774-3238
fred_wood@shaw.ca

Observatory Director

Ray Andrejowich 667-6896
randrejo@hotmail.com

Observatory Bookings

Kevin Black 224-0182
cblack@shaw.ca

Webmasters

Kevin Georgison
keving@gray.mb.ca

Ron Berard
rberard@mts.net

Gord Tulloch
gtulloch@shaw.ca

Winnicentrics Editor

Gail Wise 253-8297
wgail@mts.net

DON'T HAVE ONE? BORROW ONE!

The Winnipeg RASC owns a number of telescopes which are available for loan.

They consist of:

- ▶ a 75mm f16 polarex(unitron) refractor with an alt/az tripod
- ▶ a 4.5"f8 newtonian on a dobsonian mount
- ▶ a 6" f8 criterion on an equatorial mount
- ▶ a 8"f6 newtonian on a dobsonian mount
- ▶ a Celestron C8 8"f10 schmidt cassegrain with equatorial wedge/tripod.

All of these telescopes come with eyepieces and finder scopes. They are available on a first come-first served basis, and can be booked for 1 month at a time.

The Celestron requires a 1 year WPG RASC membership to book. The telescopes can be had by calling Ray Andrejowich at 667-6896, and can be picked up at his house or at the astronomy club meetings. Picking up and dropping off at the astronomy club meetings is the preferred method of acquiring, but alternative arrangements can be made with Ray.

FOR SALE

C5 TELESCOPE AND TRIPOD WITH TRAY (ALL REQUIRED SCREWS FOR TRAY AND TRIPOD)

6 EYEPIECES

- 9 mm
- 12 mm
- 7.5 mm
- 18 mm
- 30 mm ULTIMA
- 25 mm SMA 1.25 Wide Angle

7 FILTERS

- #1A
- POLARIZER
- 80A
- #25
- GREEN FILTER
- #21
- YELLOW FILTER

2X BARLOW ULTIMA SV SERIES

2 T ADAPTERS

1 TELEXTENDER

FINDERSCOPE

STAR DIAGONAL 1.25"

USER'S MANUAL

THE SELLING PRICE FOR EVERYTHING LISTED IS: \$1000.00 (NEGOTIABLE)

If you are in the market this is a great beginner's telescope. It is all ready to set up and use and is in excellent condition.
Call Carole at 1-204-725-1691 (Brandon).

The RASC Winnipeg Email List

As a Winnipeg Centre member, you might consider joining our with email distribution list. It's a method to send messages to many of the members in our Centre. You can ask questions, or send us updates of your latest Observations. Simply send the messages to the email address rasc-wpg@cc.umanitoba.ca, and all of us on the list can reply. To join, follow the instructions below. Your name will then be checked against the latest membership list. A message will be sent back to you to confirm your acceptance. If you have any problems, write me at stanrunge@hotmail.com and I'll try to help resolve them.

How to join the RASC Winnipeg email list,
rasc-wpg@cc.umanitoba.ca

To be able to send and receive email sent to this address you must first subscribe to the mail list by sending the following message using plain text. (Fancy HTML formatted messages will not work. Also be sure to send the following message from the email account to want to send and receive RASC mail from.)

To: listproc@cc.umanitoba.ca
Subject: (doesn't matter - no subject is OK)

In the body of the mail type only the following line, nothing else (be sure to replace Firstname and Lastname with your own):

sub rasc-wpg Firstname Lastname



Guy Wescott suggests taking a look at the web site of Gary Nugent, the president of the Irish Astronomical Society. It really is an excellent site just packed with goodies plus quite a bit of astronomical software. Site address is www.nightskyobserver.com

If I Was Naming the Constellations By Gail Wise

I know a lot of us wonder how the ancient people saw the shapes they did in the stars. If it was up to me, I would name them differently.

Boötes of course would be a giant ice cream cone and I think I would like it to be strawberry.



Corona Borealis be would be a bowl of hot tomato soup.
Triangulum would be a slice of apple pie.

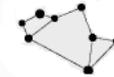


The circlet of Pisces would be an

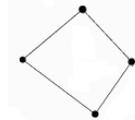
orange.



Sagittarius would be - surprise! - a pot of tea.



Pegasus would be a square of a chocolate bar.



The head of Draco would be a lollipop.



Crater would be a fancy dish for
would be the cherry on top.

dessert and Delphinus



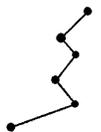
Andromeda would be a banana.
(use your imagination)



Orion would be a peanut.



Lacerta would be spaghetti.



And the moon would be a giant pizza!

